

REMARKS

Applicant cancels claims 1-7 without prejudice. As mentioned in the prior office action response for the election/restriction, the Applicant reserves the right to pursue the cancelled claims through a divisional application.

REMARKS

Claim Rejections - 35 U.S.C. § 112

The Examiner has rejected claims 1-23 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. The claims have been amended to particularly point out and distinctly claim the subject matter that the Applicant regards as the invention.

Claim Rejections - 35 U.S.C. § 102 and 103

The Examiner has rejected claims 8-10 under 35 USC 102(b) as being anticipated by either Gregory (U.S. Patent No. 4,858,073) or Novotny et al. (U.S. Patent No. 6,462,410). The Examiner has rejected claims 12-17, 19 and 20-23 are rejected under 35 USC 103(a) as being unpatentable over Gregory ('073) or Novotny et al. ('410). The Examiner has rejected claims 11 and 18 under 35 USC 103(a) as being unpatentable over either Gregory ('073) or Novotny et al. ('410) taken with either the Solberg "Impact" publication or the Kester OSP Coating 2001 publication. The Examiner has rejected claims 8, 9, 13, 15, 17, 20 and 22 under 35 USC 102(e) as being anticipated by Chien (2002/0009826). The Applicant respectfully traverses. The cited references individually or in combination do not anticipate or render obvious all of the Applicant's claim elements. In particular the cited references do not teach the claim elements of "an IC die; a thermal interface material comprising an inorganic material in direct contact with the IC die; and a thermally conductive heat spreader body coated with an organic surface protectant in direct contact with the thermal interface material" that are present in each of the independent claims 8, 13, and 20. In contrast Gregory teaches a metal heat spreader plate, which is NOT coated with an organic surface protectant, where the metal heat spreader is in contact with a solder and the solder is in contact with a die. Gregory therefore clearly fails to teach the element of a thermally

conductive heat spreader body coated with an organic surface protectant that is in direct contact with a thermal interface material and wherein the thermal interface material is in turn in direct contact with a die. Novotny also fails to teach these elements and in contrast teaches a heat dissipation structure that may include a heat spreader, which is not coated with an organic surface protectant, in contact with a solder and where the solder is in contact with a die. Again, similar to Gregory, Novotny fails to teach the organic surface protectant on a thermally conductive heat spreader body that is in direct contact with a thermal interface material and where the thermal interface material is in direct contact with a die.

Additionally, Chien fails to teach the Applicant's claim elements. In contrast, Chien teaches a copper heat spreader, that is not coated with an organic surface protectant, in contact with a partially solidified liquid-type adhesive, the adhesive being in contact with an organic substrate material, the organic substrate material in contact with metal interconnects, and the metal interconnects in contact with a die. Solberg and Kester also fail to teach all of the elements of the Applicant's claims. Therefore, the cited references do not teach the Applicant's independent claims 8,13, and 20, or the claims 9-12, 14-19, and 21-23 which depend upon and incorporate the limitations of the independent claims, respectively.

Additionally, the cited references individually or in combination do not render obvious the Applicant's claims because none of the cited references discuss improving the adhesion between a thermally conductive heat spreader and a thermal interface material comprising an inorganic material by coating the thermally conductive heat spreader with an organic surface protectant.

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If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,

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